

WHEN IT COMES TO FACES BAD INFORMATION MAY NOT BE SO BAD:
THE EFFECTS OF POST-EVENT INFORMATION ON LINE-UP
IDENTIFICATION

A Thesis

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ABSTRACT

This study sought to replicate and extend what little is known about the effect of misleading post-event information (aka the *misinformation* effect) with regards to facial identification. One-hundred eleven undergraduate students viewed a video of a staged crime and were then given newspaper articles containing misleading, non-misleading, or no information about the appearance of the perpetrator. Participants were then tested with either a target-absent line-up, where all individuals matched the misleading description of the perpetrator, or a target-present line-up, where all individuals matched the non-misleading description. Two main findings were obtained. First, misinformation did not impair line-up performance. However, participants receiving any (even misleading) facial information outperformed those participants receiving no information. These results suggest that in some cases, verbal misinformation may facilitate memory. Furthermore, they suggest that while perceptual misinformation may not easily impair visual memory, contextual information can.

BIOGRAPHICAL SKETCH

Sarah Kulkofsky received her B.A. *magna cum laude* from Colgate University in 2002 majoring in political science and psychology. She was recognized for high honors in psychology for her strong academic record and her senior honors thesis, “Evidence of Source Misattributions in Facial Identifications.” She was inducted into three national honor societies, Phi Eta Sigma (freshman honor society), Phi Sigma Alpha (national political science honor society), and Phi Beta Kappa. She joined the graduate field in the Department of Human Development at Cornell University in the fall of 2002. Her research interests include the socio-cognitive factors relating to memory accuracy and inaccuracy, the social-emotional aspects of autobiographical memory development, and facial processing and identification. Upon completion of her Ph.D. program at Cornell, she plans to obtain an academic position in developmental psychology.

To my parents.

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CHAPTER 1

INTRODUCTION

In October 2002, an unknown sniper held the Washington, D.C. area under a blanket of fear as individuals were randomly gunned down while they went about their daily lives. After the shooting of FBI criminal analyst Linda Franklin, authorities seemed to have caught a break. A witness at the scene of the shooting came forward saying that he had seen the shooter, an olive-skinned man who seemed to be Middle Eastern and who was driving a white van. The witness appeared very confident in his report, claiming to have gotten “a good look at the guy” (Leinwald & Johnson, 2002). As it turned out, after his report was released and published in the media, it was found that he was incorrect, and may have possibly purposefully mislead police (McKelway & Bradley, 2002). When the case was finally closed, it turned out that the sniper was not a lone olive-skinned Middle Eastern man in a white van, but two African American men in a blue Chevy Caprice (Dao, 2003).

Clearly an inaccurate witness, whether purposefully deceiving or simply mistaken, may cause problems for law enforcement. Following false leads can waste valuable law enforcement time and energy and may lead investigators away from the actual perpetrator. Inaccurate information may cause an additional problem when the case is highly publicized or where there are multiple possible witnesses, such as the D.C. sniper shootings. In these cases, the publicized inaccurate report could taint the memories of other potential eyewitnesses. Whether or not this is an actual possibility is an empirical question, however, despite decades of research on eyewitness behavior it has yet to be adequately answered.

Although the legal system highly regards eyewitness reports, research both in lab and in the field has shown that these reports are far from perfect. Research on

convicted individuals exonerated through DNA evidence shows that the bulk of wrongful convictions are caused by mistaken eyewitness identifications (Wells, et al, 1998). Estimates suggest that as many as 4,500 mistaken identifications result in wrongful convictions each year (Cutler & Penrod, 1995). In addition to research in the field, psychological research in the lab has shown that there are a number of factors associated with errors in eyewitness memory (see Cutler & Penrod, 1995; Loftus & Hoffman, 1989; Wells & Olson, 2003 for reviews).

One such factor often associated with errors in eyewitness memory is misleading post-event information, a finding commonly referred to as the *misinformation effect*. In the standard paradigm for studying the misinformation effect, participants view a video or series of slides depicting a staged crime and then read a narrative or answer questions containing some inaccurate information about the event. The participants are then given a surprise memory test asking them to either recognize or recall the information from the video or slides. Generally, a significant portion of participants will report having observed information that was only suggested to them. The misinformation effect has been reliably replicated in both children (e.g. Ceci, Ross, & Toglia, 1987) and adults (e.g. Belli, Lindsay, Gales, & McCarthy, 1994; Lindsay & Johnson, 1989; Loftus, Miller, & Burns, 1978; Zaragoza & Lane, 1994).

The findings on the misinformation effect suggest that indeed exposure to inaccurate information about the appearance of a perpetrator may negatively affect an eyewitness's memory of the perpetrator. However, such a conclusion may be injudicious. Most previous research on the misinformation effect has not focused on line-up identifications, but rather has been primarily concerned with actions or aspects of events (e.g. "Did the man steal a wrench or a hammer?" "Did the visitor tear the teddy bear?"). Because there are a number of differences between the standard

misinformation paradigm and line-up identifications, these previous studies may be uninformative about the effect of misinformation on line-up identifications.

One major difference between line-up identification and studies on the misinformation effect is the modality of misinformation and test presentation. In nearly all misinformation studies, post-event information and tests are presented verbally (e.g. participants are asked in a written test, “Did you see X or Y” rather than shown X and Y visually and asked which one they saw). In line-up identification, though, the test is of visual, not verbal memory. According to principals of transfer appropriate processing, or encoding specificity (e.g. Tulving, 1983), when study and test conditions match, accessing the memory trace during test is easier. In the standard misinformation paradigm, the misinformation and test modes match thus making the misinformation easier to retrieve. However, in a line-up test the original image and the test match, since both are visual in nature, making the original image more accessible and consequently possibly less susceptible to interference from verbal misinformation.

Research findings are mixed in regards to the effects of verbally presented misinformation of visual memory. Intraub and Hoffman (1992) found that when participants read descriptions of complex scenes they had previously not seen and then viewed pictures of those scenes, they reported that they had in fact viewed the pictures. This suggests that the verbal information presented to them created a false visual memory of the previously unseen picture. Similarly, Braun and Loftus (1998), found that participants verbally misled about the color of an object visually chose the misleading color from color wheel more than non-misled participants. However, Yamashita (1996) was unable to find a significant misinformation effect when participants were given either a standard misinformation test or a visually presented test. This led Yamashita (1996) to suggest, as one may expect from the transfer appropriate processing principle, that in a visual recognition test, the original visual

memory is more likely to be recovered, and thus misinformation may not effectively interfere with memory. Given the somewhat contradictory findings from only a few studies, it is not yet clear if visual recognition tests are unaffected by verbal misinformation.

In addition to differences in test modality, face recognition functions differently than other types of object recognition. Unlike other forms of visual processing, faces are more likely to be recognized as undifferentiated wholes, with little part decomposition (Farah, Wilson, Drain, & Tanaka, 1998, Rakover, 2002). In general, configural information (spatial relations and proportions between features) is more important for face recognition than featural information (isolated features such as eyes, nose, and hairline) (Bartlett, Searcy, & Abdi, 2003; Rakover, 2002).¹ Configural characteristics of faces may be more difficult to describe in words, therefore those characteristics that are easily verbalized may be less important for recognizing faces (Dodson, Johnson, & Schooler, 1997). Because the misinformation paradigm requires the use of verbally presented information, and this information may be less important for face recognition, verbal misinformation may not have the same negative effect on faces that it has on other aspects of an event.

Because of the difference in test modalities between line-up recognition and most misinformation studies, and the special nature of face processing, the effect of misinformation on faces must be directly tested and not merely inferred from previous

¹ There is still some degree of controversy surrounding the exact mechanisms for facial recognition, and there are a number of competing theories currently postulated. However, it is generally agreed upon that face recognition is different than other forms of object recognition and that configural information is more important than featural information. For a more in depth discussion of face processing, see Rakover, 2002.

research on the misinformation effect. However, despite the vast literature on eyewitness's ability to correctly identify faces (see R.C.L. Lindsay & Pozzulo, 1999; Wells, et al., 2000; and Wells & Olson, 2003 for recent reviews), the effect of misinformation on facial identifications has remained largely unexplored. Only two published studies to date have explicitly looked at this relationship (Loftus & Greene, 1980; Searcy, Bartlett, & Memon, 2000).

Loftus and Greene (1980) showed participants a slide depicting a group of people at an outdoor party, and then presented them with a description purportedly written by a professor who had viewed the slide. In one version of the description the man in the picture was erroneously described as having a moustache, while the other version was neutral in regards to facial hair. Finally, participants were given a 12 person target-absent (the perpetrator was not present) line-up where half of the men had moustaches and half did not. Loftus and Green (1980) found that the proportion of participants choosing someone with a moustache was greater in the misinformation condition compared to the neutral information condition. Similarly, Searcy et al (2000) found that participants misinformed that a previously viewed culprit had a chipped tooth were more likely to choose the single individual with a chipped tooth from a target-absent line-up, compared to participants who had not received this misinformation.

While these studies provide tantalizing evidence that misinformation can negatively impact line-up identification accuracy, they are problematic. One major problem is that the line-ups in both of these studies were biased. According to guidelines published by the U.S. Department of Justice (Technical Working Group, 1999), line-up foils (those individuals in the line-up who are not the suspect) should resemble the suspect on significant features and should, when possible, fit the witness's description of the perpetrator. If this is not possible, key distinctive features

should be masked in the suspect and all foils. Therefore, if the perpetrator was described as having a beard or a chipped tooth then all of the individuals in the line-up should have this characteristic, or in the case of the tooth, the characteristic could be masked. Using biased line-ups in research tests participants in a situation that may not resemble actual line-up identification situations thus reducing the external validity of these previous results.

Additionally, having only one individual with the unusual characteristic, such as a chipped tooth, as in Searcy et al (2000), makes that particular individual stand out. Similarly, in creating a line-up where exactly half of the members differ from the other half on a single identifiable characteristic, as in Loftus and Green (1980), attention may be drawn to this particular characteristic. Thus, by using biased line-ups the researchers may have created demand characteristics that influenced the participants' choices. For example, participants in Loftus and Green's misinformation condition may have noticed that moustaches were important to the study, remembered something about moustaches from the post-event description, and thus chose the individual with the moustache. In order to test participants with unbiased line-ups while still testing for the effects of misinformation, participants may be tested with an unbiased target-absent line-up where all foils match the misinformed description. In this case, the critical test is not whether participants pick a particular individual from the line-up, but if they pick *any* individual from the line-up. As of yet, this particular test has yet to be conducted.

Furthermore, the previous studies test misinformation for a single salient characteristic. In fact, in both Loftus and Green (1980) and Searcy et al (2000), the single characteristic was the *only* information about the appearance of the perpetrator that the participants received. These studies therefore, are uninformative about situations, such as the D.C. sniper case, where a witness provides a description of the

wrong person (opposed to a relatively accurate description that varies only slightly from the true perpetrator). This is problematic for both practical and theoretical reasons. As alluded to above, receiving a mistaken single salient characteristic may not be the type of circumstance that witnesses encounter in real life. Inaccurate descriptions may come about because a witness of the crime confuses an innocent bystander with the perpetrator. Additionally, in many cases there are no witnesses to the crime itself, but witnesses may have seen a suspicious individual near the place and time that a crime occurred. However, this “suspicious individual” may simply be an innocent party at the wrong place and the wrong time. Furthermore, characteristics such as facial hair and hairstyle are easily changed by a real life perpetrator, and thus eyewitnesses are often instructed to ignore such characteristics (Technical writing group, 1999).

Use of a single salient characteristic is theoretically problematic as well. Facial processing may switch from configural to featural processing when participants are oriented to focus on specific characteristics opposed to the face as a whole (Dodson et al, 1997; Fallshore & Schooler, 1995). Therefore, when participants are given a single characteristic to focus on, they may switch their processing to the featural level, searching for the specific characteristic mentioned in the post-event narratives as they examine the photos in the line-up. This switch may not happen when holistic person descriptions are given.

The purpose of the present study was to replicate and extend what little is known about the misinformation effect in regards to line-up identifications. Specifically, we investigated the effect of misinformation presented in the form of a global physical description (opposed to a single salient characteristic) on identification from unbiased line-ups. We were interested in not only the effect of misinformation on identification from target-absent line-ups, as in previous studies, but also from target-

present line-ups as well. The effect of misinformation may be minimized when an individual is faced with the choice of a previously viewed item versus a never before seen item (McClosky & Zaragoza, 1985), a situation analogous to choosing the correct person from a target-present line-up. Thus, the effects of misinformation may be different for target-absent versus target-present line-ups.

While the preceding discussion has focused primarily on accuracy, it is not the only variable examined in eyewitness literature; eyewitness confidence has also received much attention. Although jurors and the U.S. judiciary may highly value the confidence that an eyewitness has in his or her report (Wells, R.C.L. Lindsay, & Ferguson, 1979), confidence is not necessarily related to accuracy (Leippe, 1980; Robinson & Johnson, 1996; Wells, et al., 2000) or is only predictive under certain specific conditions (Sporer, Penrod, Read, & Cutler, 1995). In terms of the misinformation effect, research has shown that when misleading post-event information has been presented, individuals may be highly confident yet quite inaccurate (Loftus, et al, 1978). However, the effect of misinformation on confidence ratings has not been specifically examined in relation to line-up identifications. Therefore, in addition to measuring the effects of misinformation on identification accuracy, we were also interested in its effects on confidence.

In this study, participants viewed a video of a staged crime. They were then presented with misleading, non-misleading, or no information regarding the appearance of the perpetrator. Next, participants were presented with either a target-absent line-up or a target-present line-up. The line-ups were constructed so that all individuals in the target-absent line-up matched the misleading description, and all individuals in the target-present line-up matched the non-misleading description (and thus the perpetrator). By constructing our line-ups in this manner, we were able to test for negative effects of misinformation on both target-absent and target-present line-

ups while keeping the line-ups unbiased. After choosing the perpetrator from the line-up, participants reported the confidence of their decisions and provided the source of their memories. If global misinformation of a face impairs identification memory by causing participants to remember the perpetrator to be more like the misleading description they received, then we would expect participants to fail to reject the target-absent line-up by saying that the perpetrator is not there, as all the individuals in this line-up match the misinformation they received. Additionally, if there is genuine memory impairment, we may also expect participants to fail to choose the actual perpetrator from a target-present line-up since he does not resemble the individual described in the misleading description.

CHAPTER 2

METHODS

Participants

Participants were 124 undergraduate students at a large Northeastern research university. Eighteen participants were excluded from the data analysis because they suspected the research hypotheses during the suspicion probe or they knew individuals shown in the video or line-ups. This led to a final sample of 106 participants. The final sample was predominately female ($N = 80$) with a mean age of 20.27 years (Range = 18 – 27 years). The majority were Caucasian ($N = 72$), while the remainder were Asian ($N=23$), Hispanic ($N=7$), African American ($N=3$), or unspecified ($N = 1$). Participants were recruited from Psychology courses, and were offered extra credit for their participation. All participants signed informed consent and were fully debriefed at the completion of the study. Thirty-four participants were randomly assigned to the misleading information group ($N = 17$ target-absent line-up), 35 to the non-misleading information group ($N = 19$ target-absent line-up), and 37 to the no information group ($N = 17$ target absent line-up).

Materials

Video. A short 90 s video titled “A Busy Day” was produced for the purpose of the study. The video depicted a woman talking on the phone to her friend and leaving her house in a hurry in order to bring her friend a check. In the final scene of the video, the woman leaves her car running as she rushes to her friend’s house as a young Caucasian man approaches her car, enters the vehicle, and drives off. The perpetrator is shown on the film for approximately 13 s, and his face is always in view, though at varying angles and distances.

Line-up construction. Graduate students from the study university and undergraduate students at a nearby college were recruited to have their photographs taken in exchange for \$5 and/or entry into a \$50 raffle. All students were Caucasian males between 19 and 26 years old. Students were photographed with an Olympus® D-550 3.0 megapixel digital zoom camera at medium resolution in front of a uniform gray background. All photographs were digitally cropped in order make the background to face ratio consistent among all photographs. In all, 46 photographs were taken, including a photograph of the individual who portrayed the car thief.

Two separate descriptions, non-misleading and misleading, were written. The non-misleading description depicted key features of the perpetrator including age, build, hair color, hair-style, and facial features. The misleading description varied these characteristics. (See Appendix for descriptions). Based on published line-up recommendations (e.g. Wells, et al., 1998), line-ups were constructed by matching photographs to descriptions of the perpetrator rather than to a photo of the perpetrator. The target-present line-up was constructed by matching photographs to the non-misleading description and the target-absent line-up was constructed by matching photographs to the misleading description. Three independent coders rated the similarity of each of the 46 photographs to each of the two descriptions on a 5-point scale. The coders were unaware of the identity of the perpetrator and the accuracy of the descriptions. Mean similarity ratings were calculated for each photograph for each description. The six photographs with the highest mean for each description were included in the line-up for that description. Because the misleading description included the detail of a mole, the photographs were digitally touched up, using Adobe Photoshop to remove moles on target-present individuals, and add or enhance a mole on target-absent individuals. Two photographs were dropped from the target-present line-up based on pilot testing where one photo was deemed too blurry and the other

because most pilot testing participants said it was definitely not the perpetrator. These photographs were replaced with the next two highest scoring photographs.

The line-up photographs were printed by a color laser printer on 4 in by 6 in paper and were placed in a fixed random order with the constraint in the target-present line-up that the perpetrator not be in the first or last position. This was done to avoid participant biases to simply pick the first or last individual from the line-up. The photographs were then mounted to a 3 ft by 1 ft sheet of blue poster board in two rows of three.

Procedure

Participants were told that the purpose of the study was to investigate the factors that influence legal decision-making. They were informed that they would be receiving information about a crime through visual and written mediums, and then would be asked to answer questions “similar to those faced by legal professionals.” After this introduction, participants watched the video of the crime and completed a 10 min distracter task (solving word puzzles). Following the distracter task, participants were then given two “newspaper articles,” prepared specifically for this study. The first described the theft of the car and the second described the capture of a suspect. Imbedded in the first article was either the misleading, non-misleading, or no information about the physical appearance of the thief; the second article was identical for all participants and contained no physical description of the car thief. Participants were allowed to read the articles at their own pace, and most took only a few minutes. Next, in accordance with the ostensible purpose of the study, participants were given the task of ranking various charges and sentences that the individual who was arrested with the crime could be given and deciding the likelihood that the individual would commit a similar crime again. This task took approximately 5 min.

In the final task, the participants were asked to choose the person they saw steal the car in the video from a line-up. They were given the following instructions prior to viewing the line-up:

“Now I am going to show you a line-up of individuals suspected of committing the car theft. Please do not pay attention to facial hair, hair style, or hair color, as this may have changed since the time of the event. Also, be aware that the person you saw may not be in the line-up, so ‘not there’ is an option you have.”

After responding to this question, participants were asked to rate their confidence in their choice on a 7-point scale, with 7 indicating very confident and 1 indicating not at all confident. Finally, participants were told that they may have used multiple sources of information in making their line-up decision and to indicate separately whether or not they used firstly the video of the crime and secondly the newspaper article. This question was designed to test the source of their memories, and the order (video or newspaper) was counter-balanced across participants. For participants claiming to use both sources of information in making their decision, two additional confidence questions were asked. Participants were asked how confident they were that their choice reflected the person they *saw* in the video and how confident they were that their choice reflected the person they *read about* in the newspaper articles. These questions were asked in the same order that the source questions were asked. Participants were then probed for suspicion, fully debriefed, and thanked for their time.

CHAPTER 3

RESULTS

Preliminary analyses found that gender and race were independent of accuracy, therefore, data was collapsed across genders and race in all further analyses.

Line-up Accuracy

To test for accuracy, all participants' responses were coded to a dichotomous correct/incorrect variable. In the target-present line-up correct respondents were those who chose the perpetrator from the line-up. In the target-absent line-up correct respondents were those who said "not there." Figure 1 depicts the percent correct by information and line-up group.

In order to assess if receiving post-event information and type of line-up affected identification accuracy and if these two variables interacted, a logistic regression analyses was performed with accuracy (correct versus incorrect) as the outcome variable, and information group (misleading information, non-misleading information, no information), line-up group (target-present and target-absent), and an interaction term as categorical predictor variables. While a test of this model against the null model was statistically significant, $\chi^2(3) = 11.22, p < .05$, Nagelkerke $R^2 = .14$, the interaction term was not a significant predictor of outcome, $Wald = .08, p = ns$. Therefore, a test of the simpler model without the interaction term was conducted. This model was statistically significant, $\chi^2(3) = 11.14, p < .01$, Nagelkerke $R^2 = .14$. Planned contrasts showed that both the misleading information group and the non-misleading information group differed from the no information group, $Wald = 4.03, p$

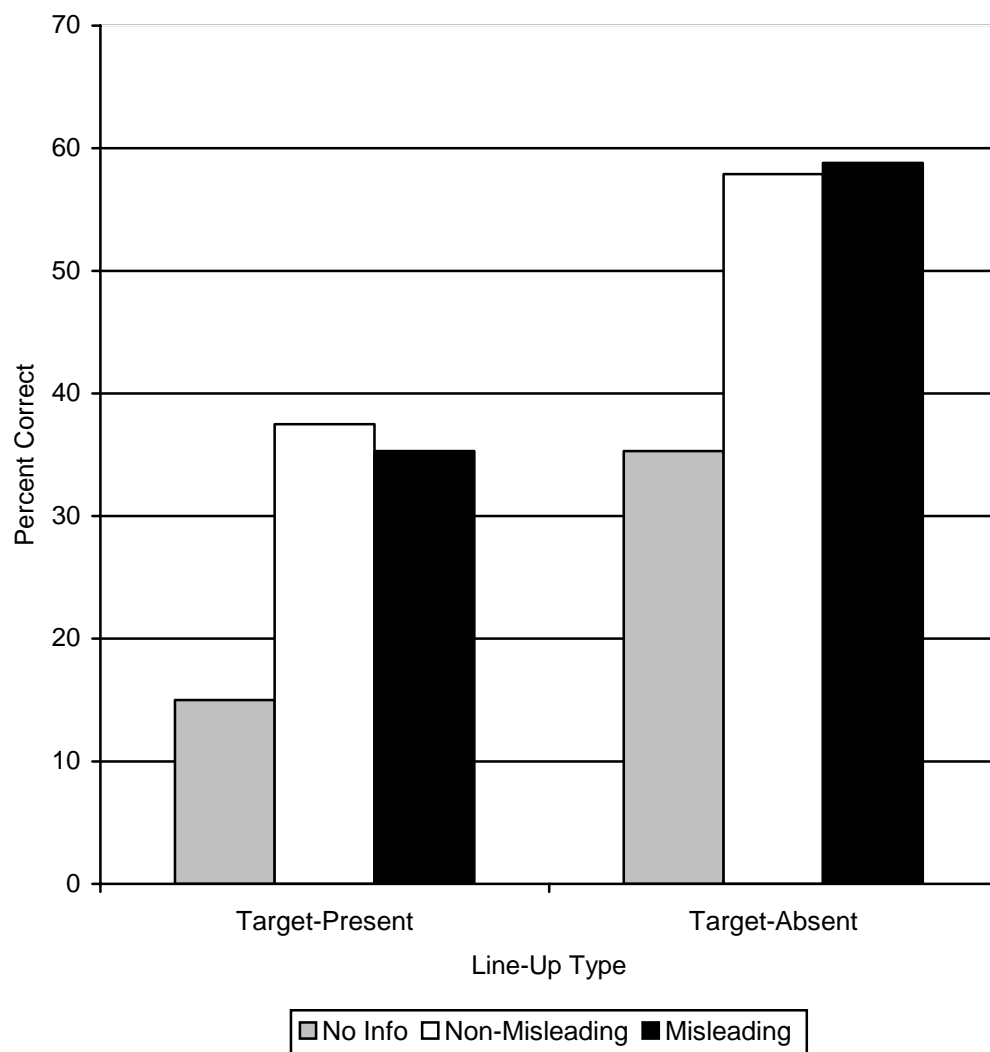


Figure 1. Percent correct as a function of line-up and information group.

$< .05$ and $Wald = 3.80, p < .05$ respectively. However, these two groups did not differ from each other, $Wald = .00, p = ns$. Contrary to our expectations, the no information group performed the worst with a 24.3% accuracy rate. In contrast, the misleading and non-misleading information groups were nearly equally accurate with a 52.9% and 51.4% accuracy rate respectively. Planned contrasts also showed that the two line-up groups differed significantly, $Wald = 5.19, p < .05$. Overall, participants viewing the target-absent line-up were more accurate than participants viewing the target-present line-up (50.9% accuracy compared to 28.3% accuracy).

We next reran the same logistic model, aggregating the misleading and non-misleading groups, to see if differences in accuracy were a function of receiving any information versus receiving none. That model was also statistically significant, $\chi^2(2) = 11.14, p < .05, Nagelkerke R^2 = .14$. This latter analysis further allows us to examine the effect of receiving any information versus none in terms of probability of accuracy. An odds ratio of 2.83 for the information variable shows that receiving any information increased the odds of choosing accurately in a line-up over three times compared to receiving no information.

Foil Choice

To assess if choice of non-target foils were distributed equally, two separate Chi-Square Likelihood Ratio analyses were conducted for each of the two line-ups. In the target-present line-up non-target choices were equally distributed among the other five foil choices, $\chi^2(4) = 7.58, p = ns$. However, in the target absent line-up foil choices were not equally distributed, $\chi^2(5) = 79.69, p < .001$. Inaccurate participants in this line-up condition chose photo number 3 a considerable number of the time (80.76%). Choice of this foil did not vary by information group, $\chi^2(4) = 3.73, p = ns$.

To test if this photograph differed from the other photographs on its similarity to the target description, its mean similarity score was compared to the mean similarity

score of the other members of the target-absent line-up. There was no significant difference between the photo number 3 and the other members, $t(4) = .48, p = ns$. As an additional check, 3 independent raters rated the similarity of each of the line-up foils to the perpetrator on a 7-point Likert type scale. Again, photo number 3 was not rated more similar to the perpetrator than the other members of the target-absent line-up, $t(4) = 1.83, p = ns$ ($M = 3.33$ for photo number 3, $M = 2.0, SD = .67$ for other line-up members). However, it was also not rated significantly less similar than the members of the target-present line-up, $t(4) = .68, p = ns$ ($M = 4.07, SD = .98$ for line-up members). Photo number 3, then, likely looked most like the perpetrator amongst the photographs in the target-absent line-up which led to his increased choice. However, this alone does not explain the pattern of results observed between the information groups, and is not considered problematic.

Confidence

To test whether or not confidence was related to accuracy a Pearson correlation was calculated between confidence and accuracy (scored 0 for incorrect and 1 for correct). As expected, confidence and accuracy were positively but not significantly correlated, $r = .12, p = ns$.

Because individuals receiving information were more accurate overall, and because they were provided more information which could potentially increase confidence, we were also interested in whether or not confidence was related to information group, and whether or not it interacted with accuracy. A 3 x 2 (information by accuracy) between subjects analyses of variance (ANOVA) was calculated. There were no main effects for information group or accuracy, $F(2,100) = 2.05, p = ns$, $F(1,100) = 3.35, p = ns$ respectively, however there was a significant information group by accuracy interaction, $F(2, 100) = 3.99, p < .05$, observable in Figure 2. Three post-hoc independent samples t-tests were conducted, correcting for

multiple tests. Among individuals receiving non-misleading and no information, there was no significant difference between correct and incorrect participants in terms of confidence. However, among individuals receiving misleading information those individuals who were correct were significantly more confident than those who were incorrect, $t(33) = 2.77, p < .05$.

Choosing versus Not There

Because of the unexpected finding that receiving any information increased correct decisions, we were left to question whether the information groups simply differed on their willingness to make a choice of an individual from the line-ups opposed to simply saying “not there.” If these groups differed on their likelihood to choose someone from the line-up, they would be coded as more correct in the target-absent line-up condition, even though their memories may not actually be any better. Although this would not be the case for the target-present line-up groups, the overall low accuracy for this condition still allows this explanation to serve as a possibility.

To test this statistically, we conducted a logistic regression with information group entered as a categorical predictor variable and choosing someone from the line-up opposed to saying “not there” as the outcome variable. This model was not statistically reliable, $\chi^2(2) = .11, p = ns$, Nagelkerke $R^2 = .00$. Therefore, the two groups did not differ in their willingness to choose.

Source

Overall, most participants said that they used the video in making their line-up decisions ($N = 104$). Fewer participants said they used the newspaper articles to make their decision ($N = 27, 25.5\%$). Only two participants claimed to have relied on the newspaper articles exclusively; one from the no information group and one from the non-mislead information group. To test if use of newspaper articles varied by line-up or information group, a logistic regression was conducted predicting use of newspaper

articles (yes or no) from these two variables.. A test of this model against the null model was not statistically reliable, $\chi^2(3) = 5.67, p = ns$, Nagelkerke $R^2 = .08$. However, an examination of the Wald statistics showed that there was a statistically significant difference among the information groups, with the accurate information group using the newspaper articles more often than the no information group, $Wald = 5.09, p < .05$. In order to assess if newspaper articles influenced accuracy irrespective of line-up or information group, a logistic regression test of this model was conducted. While this model was statistically significant, $\chi^2(4) = 11.69, p < .05$, Nagelkerke $R^2 = .14$, use of newspaper articles was not a significant predictor of accuracy, $Wald = .54, p = ns$. Therefore, while three post-event information groups differed on accuracy, this difference was not the result of participants consciously using the newspaper articles to inform their decisions.

Finally, for participants who said they used both the video of the crime and the newspaper articles in making their line-up decisions ($N = 25$), the separate confidence ratings for these two media types were compared with a paired samples t-test. Results showed that confidence that their choice reflected the person they saw ($M = 4.32, SD = 1.28$) was higher than confidence that the results reflected the person they read about ($M = 3.32, SD = 1.34$), $t(25) = 3.46, p < .05$

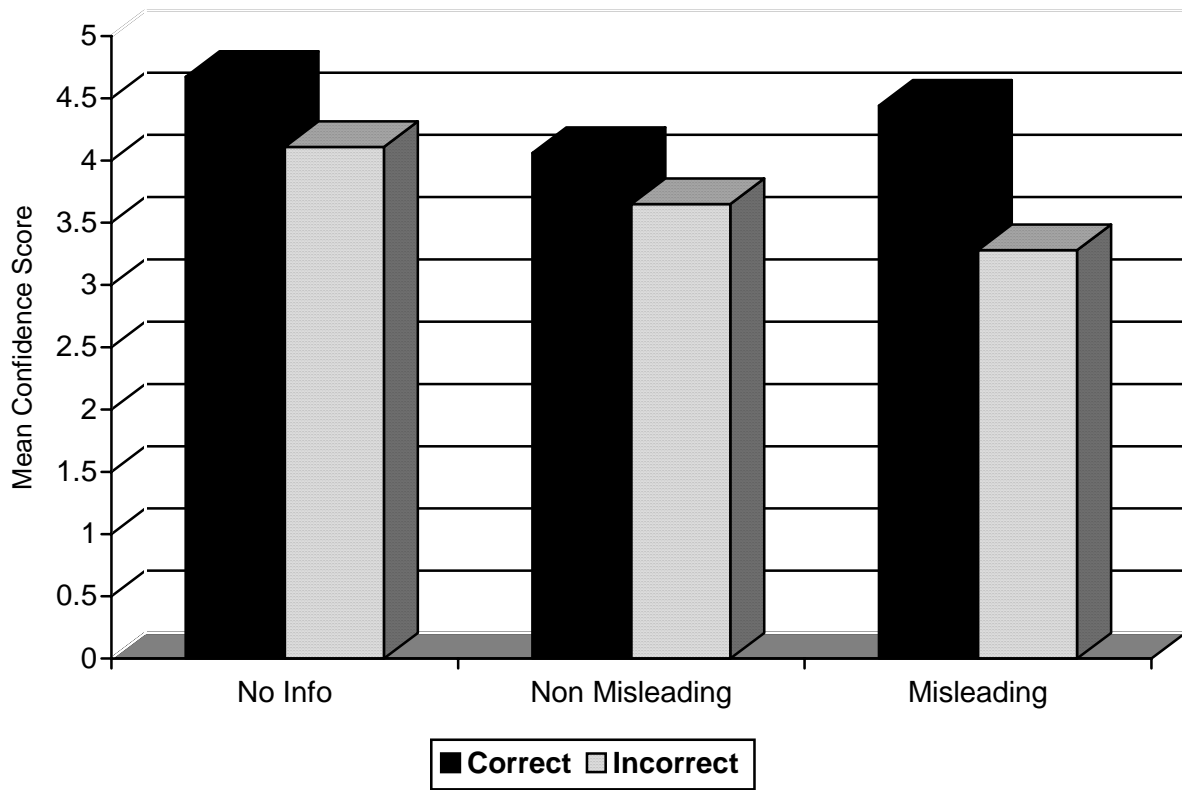


Figure 2. Mean Confidence Rating as a Function of Information and Accuracy.

CHAPTER 4

DISCUSSION

Two main findings were observed in this study. First, we were unable to replicate the misinformation effect previously observed in line-up identification studies (Loftus & Green, 1980; Searcy et al, 1980). Participants receiving misleading post-event information neither erroneously chose someone from the target-absent line-up nor failed to choose the perpetrator from the target-present line-up any more than participants receiving non-misleading information. Secondly, receiving no facial information impaired line-up identification ability compared to groups that received information. Those participants receiving no information were more than two and a half times more likely to make mistakes in the line-up task than those who received any information. In addition to these two main results, we also confirmed findings from previous research that confidence and accuracy are not correlated with each other.

The first major finding, that misleading post-event information did not impair line-up identification is not particularly surprising. Our failure to replicate is likely a result of using unbiased line-ups and providing more than a single salient characteristic. Given the complex nature of face recognition and the difference between misinformation and test modality, we expected from the outset that producing the misinformation effect in facial identification would be difficult. These findings provide further support for Yamashita's (1996) suggestion that visual tests cue the original visual image and are not impaired by verbal misinformation. Additionally, since the misleading information group outperformed the no information group, it is likely that the misleading information, as well as the non-misleading information, served a facilitating function. When presented with the verbal information about the

appearance of the perpetrator, participants were likely cued to think about his appearance and compare the verbal description to the visual image they had. While not statistically significant, mislead participants were actually more likely than non-mislead participants to make correct line-up decisions, when compared to the no information group. This counter-intuitive finding has been supported by empirical research. When children are given misinformation about highly memorable events, this information produces better, rather than worse memories (Lee & Bussey, 1999; Peterson, Parsons, & Dean, 2004). Presumably the misleading information is recognized as inconsistent, and this process of comparing the misinformation to the original memory trace, and recognizing the inconsistency, strengthens the original trace. If participants in the misleading information condition recognized the information they were receiving was not correct, then they may be more likely to enhance their original memory and perform more accurately.

There was some indication based on the confidence findings that the mislead group was conscious of the inconsistency in the information they received. While there was no difference between groups in accuracy, those who were correct and received the misleading information were more confident than those who received misleading information and were incorrect. Interestingly, unlike Loftus et al (1978), this was the only group that showed a significant relationship between confidence and accuracy. This significant relationship may reflect participants' awareness that the description did not accurately match the perpetrator. Those participants who had a clear representation of the perpetrator may have been more confident in their correct response since they were able to easily reject the misleading description. However, those with weaker memory traces, and subsequently made mistakes, may have become confused by the misleading description which lowered their overall confidence.

The lack of misinformation effect on overall line-up accuracy does not necessarily indicate that person identification is immune from misleading post-event information. Rather it shows a single exposure to an inaccurate description read shortly after viewing a crime is not enough to produce the misinformation effect in person identification. Under different testing conditions, for example if misinformation and test modality were the same, we may see a misinformation effect. In many cases, composite sketches accompany verbal descriptions in media reports of crimes. Individuals exposed to an inaccurate composite sketch may incorporate this information into their visual memory of the perpetrator and show impairment in a line-up identification task. In line with this suggestion, individuals who are exposed to mug shot books containing a suspect prior to making a line-up identification make more false identifications, presumably because viewing the mug shots interferes with their memory of the perpetrator (Bringham & Caines, 1988; Gorenstein & Ellsworth, 1980). Alternatively, witnesses are also often asked to give verbal descriptions of the perpetrator before they are asked to make a line-up identification. While verbal misinformation may not hamper their line-up identification it may influence their verbal reports, which again poses concerns for law-enforcement. These are empirical questions that have yet to be answered, and have important implications for law-enforcement.

Our second major finding, that participants who received *any* facial information outperformed those who had not, was unexpected. Participants receiving facial information, be it accurate or inaccurate, performed similarly to other participants in line-up identification studies (see Cutler & Penrod, 1995 for review), however, those not receiving information performed exceptionally poor. Indeed, the pattern of results obtained in the no information condition looked as we initially expected the misleading information to look if the misleading information impaired

line-up accuracy. This suggests that those receiving information did not simply perform better than those who did not, but rather that those who did not receive information were somehow impaired.

Why would reading a description of a previously viewed crime that did not include a physical description of the perpetrator impair line-up performance? One possibility is that the inclusion of additional contextual information about the event included in the newspaper articles (e.g. the suspect's occupation and his name that were presented) may have increased the participants' belief that he or she should be able to make a line-up decision, increasing the likelihood of choosing while not increasing accuracy. Previous research has found that receiving increased contextual information does lead to an increase in false identifications (Read, 1995, experiment 2; Searcy et al, 2000). This interpretation suggests that meta-memorial processes, rather than memorial processes are at work, indicating that participants' errors reflect their beliefs about what they should remember rather than what they actually do remember.

This explanation would only account for our data if the performance of the groups receiving facial details (e.g. perceptual information) was enhanced. In this case, we may argue that all groups received the same contextual information, increasing their willingness to choose, but the groups receiving the additional perceptual information who were cued to think about the appearance of the perpetrator had better memories and performed better. However, given that the no information group seems to have been impaired rather than the information groups being enhanced by the perceptual information, this meta-memorial explanation does not adequately explain our findings. Furthermore, if it did, we would expect there to be a difference in overall likelihood to choose, however we did not find this difference.

One possibility is that contextual information may also alter the participants' original perceptual memory by inducing schema based memory distortions. Schemas

are organized knowledge structures that reflect an individual's prior knowledge, experience, and expectations. When a person encounters an aspect of the environment that they have a schema for, this schema becomes activated (Neath, 1998). While schemas often serve as helpful memory shortcuts, memory distortions are likely to occur when a schema is activated, and particularly when the presented information is schema inconsistent (Bower, Black, & Turner, 1979; French & Richards, 1993; Tuckey & Brewer, 2003; Koriat, Goldsmith, & Pansky, 2000). For example, participants presented with a clock numbered with roman numerals, drew the clock with the four represented as IV, rather than as IIII as it actually was in the clock (French & Richards, 1993). The IIII violated participants' Roman numeral scheme, and thus their memory reports were inaccurate but more consistent with their existing schema.

In the present study, participants were told that the perpetrator was an auto-mechanic and that he was suspected in other auto thefts. This information may then activate schemas of what criminal car mechanics look like. There is evidence showing that people do tend to have pre-conceived notions about what a criminals and individuals of various occupations look like (Goldstein, Chance, & Gilbert, 1984; Hellstrom & Tekle, 1994; Shephard, Ellis, McMurrin, & Davies, 1978; Shoemaker, South, & Lowe, 1973) Given that our perpetrator was a slender, clean-cut, young man participants may not have viewed him as the prototypical car thief suspect. Unintentionally by varying the characteristics of the perpetrator, we may have provided a more stereotypical description of a suspect and consequently a target-absent line-up that fit auto mechanic car thief schemas. Participants in the no information group then remembered the suspect to look more like the individuals in the target-absent line-up, and in particular more like the individual in the target-absent line-up who most closely resembled the perpetrator, and less like the actual perpetrator

and individuals in the target-present line-up. Similar to this, Shephard et al (1978) found that when participants were given information that a previously viewed person was a murderer opposed to a lifeboat captain, they constructed his face to be more unattractive in a Photofit task. Presumably, their stereotype of murderers as unattractive changed the original perceptual memory to be less attractive. Because participants in information groups were cued to think about the appearance of the perpetrator, and subsequently rehearsed this information, they were less influenced by the auto-mechanic car thief schema and thus performed better in the line-up task.

While perceptual misinformation may not lead to errors in line-up identification, these results suggest that contextual information can in fact induce errors. This effect is robust, even with a single presentation of contextual information shortly after viewing the crime. There may be a number of reasons that this is the case. First, unlike perceptual information, contextual information may not cue participants to actively rehearse their original memory of the face. Therefore, while it may induce the incorporation of erroneous information, this information is not checked by a strengthened visual image. Secondly, contextual information may induce holistic rather than featural rehearsal (Read, 1995). When the contextual information contains consistent details this holistic rehearsal leads to better memory as the individual rehearses an accurate holistic representation of the face. Thus, individuals asked to make trait judgments about a face recognize the face more accurately than individuals asked to make featural judgments (Coin & Tiberghien, 1997). However, when this information is misleading, for example by suggesting that car thieves are not clean-cut young men, this holistic rehearsal may make the misleading information more likely to be incorporated into the participants' memory. Because perceptual misinformation necessarily involves the use of easily verbalizable features, it seems to be less effective in producing a misinformation effect.

While these results are preliminary and have yet to be replicated, they do have some practical implications. Our findings imply that when releasing information to the media, concerns about tainting other potential witnesses should not enter into decisions as to whether or not a physical description of the potential perpetrator should be released. In terms of the memories of these other potential witnesses, it appears that the more of this information they are exposed to the better. Even misleading information may reinstate the witness's original memory of the perpetrator. What appears to be a concern, however, is the release of contextual information that may trigger stereotypes of what the perpetrator should look like. This may not be a major concern for media outlets, given that when suspect information is released the identity of the suspect is often unknown, however, such information could potentially be incorporated into law enforcement interviews. Additionally, even in the absence of increased contextual information, beliefs simply about what a criminal looks like may distort eyewitness reports. When an innocent suspect fits a witness's preconceived notion of what a criminal should look like, the innocent individual may have a greater chance of being falsely identified.

It has yet to be seen if misinformation harms verbal reports of a perpetrators' appearance or if pairing verbal misinformation with a composite sketch reduces eyewitness accuracy. Since these situations are likely to be encountered in real life they should be tested before strong recommendations for real-world settings may be made. However, at a minimum the present study shows that we need not be overly concerned about the potential negative effects of misinformation about the appearance of a perpetrator on line-up identifications. While the inaccurate witness in the D.C. sniper case may have lead police down the wrong trail, it is not likely that his report damaged the memories of other potential eyewitnesses in the case.

APPENDIX

Descriptions

Non-misleading: The witness described the suspect as a man in his mid twenties with short dark brown hair. He is described as small to medium build approximately 5'8" to 6' tall. "He was a slender guy and had prominent facial features. He had these full lips that really stood out to me. I'd definitely know him if I saw him again," the witness said.

Misleading: The witness has described the suspect as a man in his early twenties with very short light to medium brown hair. He is described as medium to heavy build approximately 5'8" to 5'10" tall. "He was a solid looking guy, a sturdy stocky build. He had a little facial hair, not a beard or anything, but he looked scruffy. I'd definitely know him if I saw him again," the witness said. The witness also commented that the man had a small mole on his cheek.

No Information: The witness has described the suspect as a man in his twenties. "I'd definitely know him if I saw him again," the witness said.

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